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PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

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ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

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Applicant BLUMENBERG, Klaus-Dieter et al	

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

18 October 1999 (18.10.99)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer A. Karkachi
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(54) Title: CELLULOSE CASING FOR FOOD PRODUCTS

(57) Abstract: The invention relates to cellulose casings for food products and more particularly to pigmented tubular cellulose casings and to a method for the manufacture thereof. In the method for the manufacture of pigmented cellulose casings perylene tetracarboxylic acid pigment, in admixture with an additional pigment/pigments, is incorporated in the casing in order to produce a casing, which when stuffed with food products, produces the appearance of the product being naturally smoked, mahogany coloured or any shade of red colour. The additional pigment is selected from the group comprising (-phthalocyanine, diazo and monoazo pigments. The pigmented cellulose casing comprises 0.4 - 4 wt %, preferably 1 - 2 wt % of perylene tetracarboxylic acid.

WO 01/30165 A1

Cellulose casing for food products

5 The present invention relates to cellulose food casings and more particularly to transparent pigmented tubular cellulose food casings and to a method for the manufacture thereof.

10 Cellulose casings are widely used in food industry, specially in meat industry in the production of stuffed food products, such as sausages and the like, and they often are coated with various substances or they have substances incorporated into the casing. Cellulose casings are supplied in great lengths that are folded into highly compressed pleats forming rigid tubes formed of regenerated cellulose and containing plasticizers such as water and/or a polyol such as glycerine. The cellulose used for
15 the manufacture of casings is most commonly produced by the so-called "viscose process" wherein viscose, a soluble cellulose derivative, is extruded as a tubular film through an annular die into coagulating and regenerating baths to produce a tube of regenerated cellulose. The tube is subsequently washed, plasticized and dried. The casing may be non-reinforced or reinforced with fibers such as paper.

20 In the "viscose process" natural cellulose is treated with a caustic solution to activate the cellulose to permit derivatization and to extract certain alkali soluble fractions from the natural cellulose. The alkali cellulose obtained is shredded, aged and treated with carbon disulphide to form sodium cellulose xanthate, which is then dissolved in
25 a weak caustic solution. The viscose solution is ripened, filtered, deaerated and extruded.

30 Food casings made of derivatized cellulose usually contain additives such as colorants incorporated in or onto the casing. Liquid smokes which impart a smoky flavour and a reddish colour to the food product may also be incorporated in or coated on the casings.

From US-4,336,828 a fiber-reinforced metallic luster pigmented tubular casing and a process for the manufacture of it are known. In the manufacture of the fiber-reinforced tubular casing, a pearlescent flake pigment which preferably comprises primarily titanium dioxide-mica silver or gold or copper pigment, is mixed with an alkaline solution of commercial-grade cellulose xanthogenate, and a long fiber paper reinforced substrate is contacted and impregnated with the obtained mixture and then the impregnated mixture is hardened on the said substrate. From US-patent H1,592 is known a cellulosic food casing made from non-derivatized cellulose and N-methylmorpholine-N-oxide, wherein colouring agents such as reds, blues and yellows may be introduced into the cellulose solution prior to extrusion from the die. In patent DE 3543633 are disclosed sausage casings for raw-type sausages which are manufactured from fiber-reinforced regenerated cellulose tubes and coated on the inner surface with a water-insoluble cationic resin. The outer surface of the cellulose tubes contains 8 - 20 % pigment and only little pigment is present at the inner cellulose surface.

Variety of colours are used in casings and usually pigments are incorporated into the cellulose prior to extrusion. The commonly used red colour or different shades of red, such as reddish-brown, "colour of a well-smoked" and specially mahogany colour in casings is usually achieved by using vat-dyeing technology based for example on the Indanthren group of dyes (these dyes are manufactured by Dyestar Company). The colouring of the casings is accomplished by injecting the dye or pigment into viscose, then mixing to obtain a good dispersion of the dye and viscose, followed by impregnating the fibrous casing paper support of substrate, and then coagulating the mixture on or in the paper followed by regeneration. Once the cellulose is regenerated using baths containing diluted sulphuric acid together with ammonium and sodium sulphate salts, the casing as a flattened tube is passed into a reducing alkaline sodium hydrosulphite bath, which renders the vat-dye soluble to facilitate its movement between the swollen cellulose molecules or chains of cellulose. Thereafter the tubing is passed to an alkaline peroxide oxidizing bath

which has the effect of re-crystallizing the Indanthren dye captivated between adjacent cellulose chains and finally the whole process being completed by a sulphuric acid neutralization bath closing up the cellulose chains, which are swollen under the effect of alkali, to discourage migration. Thus, a highly transparent or clear casing with a reddish or mahogany colour, giving the product a desired smoked appearance, is obtained.

Also other pigments are used to provide colours or shades other than mahogany such as reds, browns, whites, metallic luster pigments, blacks, blues, greens, yellows, oranges, many of which are used either alone or in a mixture. However, compared to the shades provided with Indanthren type of dyes and other vat-dyes the casings provided by these pigments tend to be flat and opaque.

The widely used vat-dyeing technology has some major disadvantages. In the processing there lies a need for extra processing steps i.e. reducing by hydrosulphite bath, oxidizing by peroxide bath and neutralizing by acid baths. The additional baths contain up to 25 g/l of sodium hydroxide and between 5 and 35 g/l of sodium dithionite, used at a temperature of 25 to 55 °C, which has the effect of converting the Indanthren dyes to their soluble reduced forms, followed either by a number of wash baths, the last of which can comprise an acid neutralisation stage, using approx. 10 to 60 g/l of sulphuric acid and a temperature of 15 to 65 °C, to convert them back to their crystalline oxidised forms, or a number of wash baths containing also 2 to 20 g/l of dilute sodium peroxide solution at 15 to 45 °C to assist the conversion back to the oxidised forms, prior to neutralisation as before. The latter baths can contain strong corrosive chemicals, which can lead to a weakening of the cellulose structure of the casing. The use of these baths, while being costly to be kept refreshed with chemicals and hot water and mechanically maintained, they take up additional space and once so treated, the casing product is mechanically weaker than its non-vat-dyed counter-part because of the absence of such chemical interactions. Additionally, because several baths with lots of chemicals are used, environmentally undersired waste chemical solutions are formed.

Chemical reduction has from time-to-time been a problem with the Indanthren dyes if they have not been properly fixed in the casing i.e. between adjacent chains of cellulose within the wall of the casing. The phenomenon of reduction may occur in
5 vat-dyed casings which contain meat emulsion, such as summer sausages, also known as balkan sausage. The sausage is often vacuum-packed for extended shelf-life reasons even up to 12 months and micro-organisms, such as bacteria, which are always present to a larger or lesser extent in such products, begin to act chemically and affect the oxidation state of the dye. In many cases this change in oxidation state
10 is accompanied by a change in colour. Oxidised colour, reddish brown changes to reduced form, dark green, which may give rise to complaints of the product being streaked black and therefore contaminated.

Based on the above it can be seen that there is a need for an improved method for the
15 manufacture of a pigmented cellulose casing, particularly of a mahogany coloured cellulose casings and for a pigmented cellulose casing, particularly a mahogany coloured cellulose casing.

An object of the invention is to provide a method for the manufacture of a pigmented
20 cellulose casing, particularly mahogany coloured cellulose casings and a pigmented cellulose casing, particularly a mahogany coloured cellulose casing obtained thereby, which are not subject to discolouration by virtue of microorganism activity in a vacuum pack.

25 A further object of the present invention is to achieve the appearance and aesthetics of the mahogany coloured cellulose casings based on Indrantren type of dyes without the processing steps required by a vat-dyeing technology.

30 A further object of the invention is to avoid or significantly reduce the disadvantages of the prior art dyeing technology, and to switch to an environmentally more friendly method.

Characteristics of the method for the manufacture of a pigmented cellulose casing and particularly of a mahogany coloured cellulose casing and of the pigmented cellulose casing, particularly the mahogany coloured cellulose casings are stated in the claims.

The above-identified objectives can be achieved and the disadvantages of the pigmented cellulose casings and of the methods for the manufacture thereof according to the state of the art can be avoided or reduced significantly by the method according to the invention. It has been realized that pigmented, red or reddish coloured and preferably transparent mahogany coloured cellulose casings with different shades of mahogany, particularly fibrous casings, with the appearance and aesthetics of the casings based on the Indanthren pigmenting system of the state of the art, having natural smoked colour, can be manufactured by incorporating into viscose a combination of specific pigments.

In the method according to the invention, for the manufacture of pigmented cellulose casings, perylene tetracarboxylic acid pigment in admixture with other pigments, preferably β -phthalocyanine, diazo and monoazo pigments, is incorporated in the casing in order to produce a casing, which may be transparent and which when stuffed with food products, produces the appearance of the product being naturally smoked, mahogany coloured or any shade of red colour.

Suitable pigments are perylene tetracarboxylic acid (Hostafine® Red P2GL LP, colour index P.R. 179), β -phthalocyanine (Hostafine® Blau B26, P.B. 15:3), diazo (Hostafine® Gelb HR, P.Y. 102), and monoazo (Viscofil® yellow RL, P.Y. 102) all manufactured by Clariant GmbH. These pigments are liquid suspensions, which are miscible in all proportions with water. In the casing 0.4 - 4 wt%, preferably 1 - 2 wt% of perylene tetracarboxylic acid is used in admixture with other pigments, preferably with 0.01 - 0.3 wt% of β -phthalocyanine and/or 0.3 - 2.6 wt% of diazo and/or monoazo pigments based on dry weight, to modify its hue and to create

replacements for colours such as yellow, blue, mahogany, burgundy and natural smoked colours, previously obtained with vat-dyes, such as Indanthren dyes.

In the method according to the invention the pigments/dyes are either weighed or
5 measured by volume and then diluted with water or in smaller batches with viscose,
ready for injection into the main viscose line ahead of the casing extrusion die.
Following the initial coagulation, regeneration and washing stages of the
manufacture of cellulose casings, just washing of the pigmented casings and finally a
plasticisation treatment are required. Coagulation follows extrusion of pigment/dye
10 containing viscose into the paper substrate and treatment with dilute sulphuric acid
solution containing 40 - 80 g/l of sulphuric acid, 8 - 80 g/l of ammonium sulphate
and 150 - 250 g/l of sodium sulphate, when the cellulose-pigment/dye gel sets in the
paper substrate. Then follows the regeneration of the sodium cellulose xanthate of
the viscose into cellulose, using the aforementioned acid solution which undergoes
15 progressive dilution and increasing temperature, from 20 to 35 °C to 35 to 65 °C
during passage through between 5 and 15 baths. Plasticisation in a polyol bath up to a
casing, e.g. glycerol content, of 15 to 25 % is the final wet process before drying for
a so-called "regular casing". "Meat-cling" or "Easy-peel" finishes may also be
applied subsequent to the plasticisation stage prior to drying but these are optional.

20 To prepare viscose ahead of the viscose-pigment impregnation stage referred to
above, wood pulp is slurried with sodium hydroxide solution, followed by removal
of excess lye, to a sodium cellulose composition. As a pressed cake it is fed to a
shredder and in a comminuted form the so-called alkali cellulose is oxidised. So
25 oxidised the alkali cellulose is fed to a xanthation reactor, liquid carbon disulphide is
introduced, and the reaction is allowed to proceed to completion, in the formation
first of cellulose xanthate, prior to dissolving in sodium hydroxide solution. The
sodium cellulose xanthate so formed is meta stable and at first undergoes a
thermodynamic rearrangement in which the haphazardly substituted hydroxyl groups
30 of the glycosidic units comprising the cellulose molecule are arranged more
equitably among neighbouring glycoside unit hydroxyl groups, during which process

viscose viscosity is seen to drop. At the same time the molecule also begins to de-xanthate, which is to say a number of the carbon disulphide xanthate groups are lost from the molecule, resulting in a rise in viscosity and ultimately, if allowed to continue, to gelation. For the purposes of fibrous casing manufacture during the latter processes the viscose is filtered to remove any unreacted fibres and its degree of substitution is monitored. The viscose is extruded onto and into the paper substrate of the casing at a pre-determined ripening index.

The advantages of the method and the pigmented fibrous cellulose casings according to the invention are provided as follows. The vat-dyeing process is rendered redundant and thus the extra chemical treatments with strong corrosive chemicals, i.e. reducing by hydrosulphite bath, oxidizing by peroxide bath and neutralizing by acid baths can be avoided. The casings and the method for their manufacture according to the invention are environmentally more friendly and mechanically stronger since less chemicals are used to process them. The method according to the invention provides colours which are not subject to chemical reduction or to discolouration by virtue of microorganism activity in a vacuum-pack. Because the bulk of fibrous casings are sold un-pigmented most machines built to produce casings are not equipped with the vat-dyeing baths required to make the coloured casing, resulting in a lack of flexibility in the production. The method for the manufacture of pigmented casings according to the invention requires no vat-dyeing baths, which results in a considerably reduced production and delivery time.

The invention is further illustrated by the following Examples, which however are not meant to limit the scope thereof.

Examples 1 - 3

Three pigmented fibrous casings were prepared with varying amounts of pigments. The recipes are provided in the following Table 1.

Table 1.

Example Number	1	2	3
Paper, length, m	1000	1000	1000
Paper, width, m	1.24	0.124	1.58
Paper, weight, kg/m ²	0.017	0.017	0.021
Paper, weight, kg/1000 m	2.108	2.108	3.318
Casing weight, kg/1000 m	7.8	7.8	12.0
Glycerol content, %	22	22	22
Glycerol weight, kg/1000 m	1.716	1.716	2.64
Water content, %	5.0	5.0	5.0
Water weight, kg/1000 m	0.39	0.39	0.50
Viscose weight, kg/1000 m	46.8	46.8	73.6
Cellulose content, %	7.2	7.2	7.2
Cellulose weight, kg/1000 m	3.37	3.37	5.30
Pigments:			
Hostafine* Rot P2GL*, kg/1000 m	0.371	0.385	0.429
Dry content, %	35	35	35
Dry weight, kg/1000 m	0.130	0.135	0.150
Amount in casing, %	1.7	1.7	1.3
Hostafine* Gelb HR*, kg/1000 m	0.169	0.161	none
Dry content, %	43	43	-
Dry weight, kg/1000 m	0.073	0.069	-
Amount in casing, %	0.9	0.9	
Viscofil* Yellow RL	none	none	0.810
Dry content, %	-	-	20
Dry weight, kg/1000 m	-	-	0.162
Amount in casing, %			1.4
Hostafine* Blue B2G	0.017	0.006	0.011
Dry content, %	48	48	48
Dry weight, kg/1000 m	0.008	0.003	0.005
Amount in casing, %	0.1	0.04	0.04
Casing SCAN-P8:93 outside surface, %	93.7	91.7	92.9
Opacity (ISO 2471) inside surface, %	96.5	96.2	95.3
Colour of casing	mahogany	mahogany	mahogany

Note*: "Hostafine" and "Viscofil" are registered trademarks of CLARIANT GMBH.

Claims

1. A method for the manufacture of pigmented, optionally transparent cellulose casings, which when stuffed with food products, produces the appearance of the product being naturally smoked, mahogany coloured or any shade of red colour, characterized in that perylene tetracarboxylic acid pigment in admixture with an additional pigment/pigments, diluted in water, are incorporated ahead of casing extrusion die, into viscose which is extruded into casing, which is then coagulated, regenerated, washed and plasticized.
2. A method according to claim 1, characterized in that the additional pigment is selected from the group comprising β -phthalocyanine, diazo and monoazo pigments.
3. A method according to claim 1 or 2, characterized in that the amount of perylene tetracarboxylic acid is 0.4 - 4 wt%, preferably 1 - 2 wt% and the amount of β -phthalocyanine is 0.01 - 3 wt% and the total amount of diazo and/or of monoazo pigment is 0.03 - 2 wt%, calculated from the dry weight of the casing.
4. A pigmented, optionally transparent cellulose casing, characterized in that it comprises 0.4 - 4 wt%, preferably 1 - 2 wt% of perylene tetracarboxylic acid.
5. A pigmented cellulose casing according to claim 4, characterized in that it additionally comprises 0.01 - 0.3 wt% of β -phthalocyanine and/or 0.3 - 2.6 wt% of diazo and/or monoazo pigments.
6. A pigmented cellulose casing according to claim 4 or 5, characterized in that the colour of the casing, when stuffed with food products, is any shade of red, of mahogany colour, burgundy colour or colour of naturally smoked.
7. A pigmented cellulose casing according to any one of claims 4 - 6, characterized in that the casing is a fibrous casing.

8. A pigmented cellulose casing according to any one of claims 4 - 7, characterized in that the casing when stuffed with food products, preferably summer sausage, has the appearance and asthetics of the casings based on the Indanthren pigmenting system.
- 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 00/00922

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A22C 13/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A22C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC, CA, FOOD SCIENCE & TECHNOLOGY ABSTRACTS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0692194 A1 (VISKASE CORPORATION), 17 January 1996 (17.01.96), abstract; page 12, line 6 - line 28 --	1-8
X	US 4944970 A (KARL STENGER ET AL), 31 July 1990 (31.07.90), abstract; column 4, line 10 - line 17 --	1-8
X	GB 1062421 A (FARBWERKE HOECHST AKTIENGESELLSCHAFT VORMALS MEISTER LUCIUS & BRUNING), 22 March 1967 (22.03.67), page 2, line 101 - line 110 --	1-8
X	DE 19814924 A1 (BASF AG), 7 October 1999 (07.10.99), page 4, line 54 - line 56 --	1-8



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

29 January 2001

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 00/00922

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 9955164 A1 (WOLFF WALSRÖDE AG), 4 November 1999 (04.11.99) -- -----	1-8

INTERNATIONAL SEARCH REPORT

Information on patent family members

27/12/00

International application No.

PCT/FI 00/00922

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
EP	0692194	A1	17/01/96	US	H1592 H	03/09/96
US	4944970	A	31/07/90	AT	86075 T	15/03/93
				CA	1308505 A	06/10/92
				DE	3801344 A	27/07/89
				DE	58903623 D	00/00/00
				EP	0325151 A,B	26/07/89
				SE	0325151 T3	
				FI	91212 B,C	28/02/94
				FI	890232 A	20/07/89
				JP	2008227 A	11/01/90
GB	1062421	A	22/03/67	NONE		
DE	19814924	A1	07/10/99	NONE		
WO	9955164	A1	04/11/99	AU	3817299 A	16/11/99
				DE	19818891 A	04/11/99

PCT

INTERNATIONALER RECHERCHENBERICHT

(Artikel 18 sowie Regeln 43 und 44 PCT)

Aktenzeichen des Anmelders oder Anwalts WW 5504-PC Pt	<table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> WEITERES VORGEHEN </td> <td style="width: 50%; vertical-align: top;"> siehe Mitteilung über die Übermittlung des internationalen Recherchenberichts (Formblatt PCT/ISA/220) sowie, soweit zutreffend, nachstehender Punkt 5 </td> </tr> </table>	WEITERES VORGEHEN	siehe Mitteilung über die Übermittlung des internationalen Recherchenberichts (Formblatt PCT/ISA/220) sowie, soweit zutreffend, nachstehender Punkt 5
WEITERES VORGEHEN	siehe Mitteilung über die Übermittlung des internationalen Recherchenberichts (Formblatt PCT/ISA/220) sowie, soweit zutreffend, nachstehender Punkt 5		
Internationales Aktenzeichen PCT/EP 99/ 02553	<table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> Internationales Anmeldedatum (Tag/Monat/Jahr) 16/04/1999 </td> <td style="width: 50%; vertical-align: top;"> (Frühestes) Prioritätsdatum (Tag/Monat/Jahr) 28/04/1998 </td> </tr> </table>	Internationales Anmeldedatum (Tag/Monat/Jahr) 16/04/1999	(Frühestes) Prioritätsdatum (Tag/Monat/Jahr) 28/04/1998
Internationales Anmeldedatum (Tag/Monat/Jahr) 16/04/1999	(Frühestes) Prioritätsdatum (Tag/Monat/Jahr) 28/04/1998		
Anmelder WOLFF WALSRÖDE AG et al.			

Dieser internationale Recherchenbericht wurde von der Internationalen Recherchenbehörde erstellt und wird dem Anmelder gemäß Artikel 18 übermittelt. Eine Kopie wird dem Internationalen Büro übermittelt.

Dieser internationale Recherchenbericht umfaßt insgesamt 3 Blätter.

☒ Darüber hinaus liegt ihm jeweils eine Kopie der in diesem Bericht genannten Unterlagen zum Stand der Technik bei.

1. Grundlage des Berichts

a. Hinsichtlich der **Sprache** ist die internationale Recherche auf der Grundlage der internationalen Anmeldung in der Sprache durchgeführt worden, in der sie eingereicht wurde, sofern unter diesem Punkt nichts anderes angegeben ist.

☐ Die internationale Recherche ist auf der Grundlage einer bei der Behörde eingereichten Übersetzung der internationalen Anmeldung (Regel 23.1 b)) durchgeführt worden.

b. Hinsichtlich der in der internationalen Anmeldung offenbarten **Nucleotid- und/oder Aminosäuresequenz** ist die internationale Recherche auf der Grundlage des Sequenzprotokolls durchgeführt worden, das

☐ in der internationalen Anmeldung in schriftlicher Form enthalten ist.

☐ zusammen mit der internationalen Anmeldung in computerlesbarer Form eingereicht worden ist.

☐ bei der Behörde nachträglich in schriftlicher Form eingereicht worden ist.

☐ bei der Behörde nachträglich in computerlesbarer Form eingereicht worden ist.

☐ Die Erklärung, daß das nachträglich eingereichte schriftliche Sequenzprotokoll nicht über den Offenbarungsgehalt der internationalen Anmeldung im Anmeldezeitpunkt hinausgeht, wurde vorgelegt.

☐ Die Erklärung, daß die in computerlesbarer Form erfaßten Informationen dem schriftlichen Sequenzprotokoll entsprechen, wurde vorgelegt.

2. ☐ Bestimmte Ansprüche haben sich als nicht recherchierbar erwiesen (siehe Feld I).

3. ☐ Mangelnde Einheitlichkeit der Erfindung (siehe Feld II).

4. Hinsichtlich der Bezeichnung der Erfindung

☒ wird der vom Anmelder eingereichte Wortlaut genehmigt.

☐ wurde der Wortlaut von der Behörde wie folgt festgesetzt:

5. Hinsichtlich der Zusammenfassung

☒ wird der vom Anmelder eingereichte Wortlaut genehmigt.

☐ wurde der Wortlaut nach Regel 38.2b) in der in Feld III angegebenen Fassung von der Behörde festgesetzt. Der Anmelder kann der Behörde innerhalb eines Monats nach dem Datum der Absendung dieses internationalen Recherchenberichts eine Stellungnahme vorlegen.

6. Folgende Abbildung der **Zeichnungen** ist mit der Zusammenfassung zu veröffentlichen: Abb. Nr. ---

☐ wie vom Anmelder vorgeschlagen

☐ weil der Anmelder selbst keine Abbildung vorgeschlagen hat.

☐ weil diese Abbildung die Erfindung besser kennzeichnet.

☐ keine der Abb.



A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES
 IPK 6 A22C13/00

Nach der Internationalen Patentklassifikation (IPK) oder nach der nationalen Klassifikation und der IPK

B. RECHERCHIERTE GEBIETE

Recherchierter Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole)
 IPK 6 A22C

Recherchierte aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
Y	US 3 293 340 A (D. WEARRING) 20. Dezember 1966 (1966-12-20) in der Anmeldung erwähnt Spalte 3, Zeile 61 - Spalte 6, Zeile 33 Spalte 9, Zeile 58 - Spalte 11, Zeile 23; Ansprüche 1-6	1-9
Y	US 3 149 905 A (K. WEBER) 22. September 1964 (1964-09-22) in der Anmeldung erwähnt Spalte 1, Zeile 33 - Spalte 2, Zeile 52; Ansprüche 1-13	1-9
A	US 2 043 069 A (R. RÜSCH) 2. Juni 1936 (1936-06-02) in der Anmeldung erwähnt das ganze Dokument	1
	--- -/-	

☒ Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen

☒ Siehe Anhang Patentfamilie

* Besondere Kategorien von angegebenen Veröffentlichungen :

"A" Veröffentlichung, die den allgemeinen Stand der Technik definiert, aber nicht als besonders bedeutsam anzusehen ist

"E" älteres Dokument, das jedoch erst am oder nach dem internationalen Anmeldedatum veröffentlicht worden ist

"L" Veröffentlichung, die geeignet ist, einen Prioritätsanspruch zweifelhaft erscheinen zu lassen, oder durch die das Veröffentlichungsdatum einer anderen im Recherchenbericht genannten Veröffentlichung belegt werden soll oder die aus einem anderen besonderen Grund angegeben ist (wie ausgeführt)

"O" Veröffentlichung, die sich auf eine mündliche Offenbarung, eine Benutzung, eine Ausstellung oder andere Maßnahmen bezieht

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"&" Veröffentlichung, die Mitglied derselben Patentfamilie ist

Datum des Abschlusses der internationalen Recherche

1. September 1999

Absendedatum des internationalen Recherchenberichts

13/09/1999

Name und Postanschrift der Internationalen Recherchenbehörde
 Europäisches Patentamt, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Bevollmächtigter Bediensteter

Permentier, W



C.(Fortsetzung) ALS WESENTLICH ANGESEHENE UNTERLAGEN		
Kategorie°	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
A	US 2 521 101 A (C. J. B. THOR) 5. September 1950 (1950-09-05) Ansprüche 1-12 ----	1
A	EP 0 156 237 A (TEEPAK, INC.) 2. Oktober 1985 (1985-10-02) Ansprüche 1-11 ----	1
A	DATABASE WPI Section Ch, Week 8903 Derwent Publications Ltd., London, GB; Class A11, AN 82-05622J XP002113884 & JP 57 176158 A (TOHO CELLOPHANE KK), 29. Oktober 1982 (1982-10-29) Zusammenfassung -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 99/02553

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3293340	A	20-12-1966	NONE	
US 3149905	A	22-09-1964	CH 372277 A DE 1222463 B GB 902364 A	
US 2043069	A	02-06-1936	NONE	
US 2521101	A	05-09-1950	NONE	
EP 156237	A	02-10-1985	AU 553677 B AU 3946085 A BR 8501409 A DK 139985 A FI 851176 A JP 60210940 A	24-07-1986 03-10-1985 26-11-1985 30-09-1985 30-09-1985 23-10-1985
JP 57176158	A	29-10-1982	JP 1517320 C JP 63065505 B	07-09-1989 15-12-1988

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INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE
INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

<p>(51) Internationale Patentklassifikation 6 : A22C 13/00</p>	<p>AI</p>	<p>(11) Internationale Veröffentlichungsnummer: WO 99/55164 (43) Internationales Veröffentlichungsdatum: 4. November 1999 (04.11.99)</p>
<p>(21) Internationales Aktenzeichen: PCT/EP99/02553 (22) Internationales Anmeldedatum: 16. April 1999 (16.04.99) (30) Prioritätsdaten: 198 18 891.9 28. April 1998 (28.04.98) DE (71) Anmelder (für alle Bestimmungsstaaten ausser US): WOLFF WALSRODE AG [DE/DE]; D-29655 Walsrode (DE). (72) Erfinder; und (75) Erfinder/Anmelder (nur für US): BLUMENBERG, Klaus-Dieter [DE/DE]; Eichenstrasse 30, D-29664 Walsrode (DE). NEUSCHULZ, Willi [DE/DE]; Kuckucks- berg 6, D-29683 Fallingb. (DE). (74) Anwalt: PETTRICH, Klaus-Günter; Bayer Aktiengesellschaft, D-51368 Leverkusen (DE).</p>		<p>(81) Bestimmungsstaaten: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO Patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Veröffentlicht Mit internationalem Recherchenbericht. Vor Ablauf der für Änderungen der Ansprüche zugelassenen Frist; Veröffentlichung wird wiederholt falls Änderungen eintreffen.</p>
<p>(54) Title: METHOD FOR PRODUCING TRANSPARENT, COLOURED CELLULOSE SLEEVES (54) Bezeichnung: VERFAHREN ZUR HERSTELLUNG VON TRANSPARENT EINGEFÄRBTEN CELLULOSEHÜLLEN (57) Abstract The invention relates to a method for producing coloured, tubular sleeves for food made of a non-woven material coated with regenerated cellulose. The invention is characterized in that an alkaline dye bath is added to the viscose solution used to produce the layer of regenerated cellulose, which dye bath contains at least one dye which has been transformed by chemical reduction into an alkali-soluble form and can be converted by oxidation into its insoluble form. A tubular non-woven material is coated with the mixture consisting of the viscose solution and dye bath, the viscose coagulates and is regenerated to yield a cellulose hydrate gel and the dye distributed in the viscose is reconverted by oxidation into its insoluble form. The invention also relates to tubular sleeves for food and to their use as artificial sausage casings. (57) Zusammenfassung Verfahren zur Herstellung von eingefärbten, schlauchförmigen Nahrungsmittelhüllen aus Cellulose regeneratbeschichtetem Faservlies, dadurch gekennzeichnet, daß der zur Erzeugung der Cellulose regenerat-schicht verwendeten Viskoselösung eine alkalische Farbflotte zugemischt ist, die mindestens einen vorher durch chemische Reduktion in eine alkalilösliche Form überführten Farbstoff enthält, welcher durch Oxidation in seine unlösliche Form umgewandelt werden kann, mit dem Gemisch aus Viskoselösung und Farbflotte ein schlauchförmiges Faservlies beschichtet wird, die Viskose koaguliert und zu Cellulosehydrat-Gel regeneriert wird und der in der Viskose verteilte Farbstoff durch Oxidation in seine unlösliche Form zurücküberführt wird, nach diesem Verfahren hergestellte schlauchförmige Nahrungsmittelhüllen und deren Verwendung als künstliche Wursthülle.</p> <p>WW 5504</p>		

LEDIGLICH ZUR INFORMATION

Codes zur Identifizierung von PCT-Vertragsstaaten auf den Kopfbögen der Schriften, die internationale Anmeldungen gemäss dem PCT veröffentlichen.

AL	Albanien	ES	Spanien	LS	Lesotho	SI	Slowenien
AM	Armenien	FI	Finnland	LT	Litauen	SK	Slowakei
AT	Österreich	FR	Frankreich	LU	Luxemburg	SN	Senegal
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DE	Deutschland	LI	Liechtenstein	SD	Sudan		
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VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS

REC'D 18 FEB 2000

PCT

WIPO PCT

INTERNATIONALER VORLÄUFIGER PRÜFUNGSBERICHT

(Artikel 36 und Regel 70 PCT)



Aktenzeichen des Anmelders oder Anwalts WW 5504-PC Pt	WEITERES VORGEHEN siehe Mitteilung über die Übersendung des internationalen vorläufigen Prüfungsbericht (Formblatt PCT/IPEA/416)	
Internationales Aktenzeichen PCT/EP99/02553	Internationales Anmeldedatum (Tag/Monat/Jahr) 16/04/1999	Prioritätsdatum (Tag/Monat/Tag) 28/04/1998
Internationale Patentklassifikation (IPK) oder nationale Klassifikation und IPK A22C13/00		
Anmelder WOLFF WALSRÖDE AG et al.		

- Dieser internationale vorläufige Prüfungsbericht wurde von der mit der internationale vorläufigen Prüfung beauftragte Behörde erstellt und wird dem Anmelder gemäß Artikel 36 übermittelt.
- Dieser BERICHT umfaßt insgesamt 3 Blätter einschließlich dieses Deckblatts.
 - ☐ Außerdem liegen dem Bericht ANLAGEN bei; dabei handelt es sich um Blätter mit Beschreibungen, Ansprüchen und/oder Zeichnungen, die geändert wurden und diesem Bericht zugrunde liegen, und/oder Blätter mit von der Behörde vorgenommenen Berichtigungen (siehe Regel 70.16 und Abschnitt 607 der Verwaltungsrichtlinien zum PCT).

Diese Anlagen umfassen insgesamt Blätter.

- Dieser Bericht enthält Angaben zu folgenden Punkten:

- I ☒ Grundlage des Berichts
- II ☐ Priorität
- III ☐ Keine Erstellung eines Gutachtens über Neuheit, erfinderische Tätigkeit und gewerbliche Anwendbarkeit
- IV ☐ Mangelnde Einheitlichkeit der Erfindung
- V ☒ Begründete Feststellung nach Artikel 35(2) hinsichtlich der Neuheit, der erfinderische Tätigkeit und der gewerbliche Anwendbarkeit; Unterlagen und Erklärungen zur Stützung dieser Feststellung
- VI ☐ Bestimmte angeführte Unterlagen
- VII ☐ Bestimmte Mängel der internationalen Anmeldung
- VIII ☐ Bestimmte Bemerkungen zur internationalen Anmeldung

Datum der Einreichung des Antrags 18/10/1999	Datum der Fertigstellung dieses Berichts 16.02.2000
Name und Postanschrift der mit der internationalen vorläufigen Prüfung beauftragten Behörde:  Europäisches Patentamt D-80298 München Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Bevollmächtigter Bediensteter Weber, G Tel. Nr. +49 89 2399 8656 

I. Grundlage des Berichts

1. Dieser Bericht wurde erstellt auf der Grundlage (*Ersatzblätter, die dem Anmeldeamt auf eine Aufforderung nach Artikel 14 hin vorgelegt wurden, gelten im Rahmen dieses Berichts als "ursprünglich eingereicht" und sind ihm nicht beigelegt, weil sie keine Änderungen enthalten.*):

Beschreibung, Seiten:

1-13 ursprüngliche Fassung

Patentansprüche, Nr.:

1-9 ursprüngliche Fassung

2. Aufgrund der Änderungen sind folgende Unterlagen fortgefallen:

- ☐ Beschreibung, Seiten:
☐ Ansprüche, Nr.:
☐ Zeichnungen, Blatt:

3. ☐ Dieser Bericht ist ohne Berücksichtigung (von einigen) der Änderungen erstellt worden, da diese aus den angegebenen Gründen nach Auffassung der Behörde über den Offenbarungsgehalt in der ursprünglich eingereichten Fassung hinausgehen (Regel 70.2(c)):

4. Etwaige zusätzliche Bemerkungen:

V. Begründete Feststellung nach Artikel 35(2) hinsichtlich der Neuheit, der erfinderischen Tätigkeit und der gewerblichen Anwendbarkeit; Unterlagen und Erklärungen zur Stützung dieser Feststellung

1. Feststellung

Neuheit (N)	Ja: Ansprüche	1-9
	Nein: Ansprüche	
Erfinderische Tätigkeit (ET)	Ja: Ansprüche	1-9
	Nein: Ansprüche	
Gewerbliche Anwendbarkeit (GA)	Ja: Ansprüche	1-9
	Nein: Ansprüche	

2. Unterlagen und Erklärungen

siehe Blatt



ad V:

Der Gegenstand der Ansprüche 1 bis 9 erfüllt die Anforderungen an Artikel 33(2) und (3) PCT. Der, bereitsin der Beschreibung abgehandelte nächstliegende Stand der Technik US-A-3293340 beschreibt das Vermischen einer Pigmentpaste mit der Viskose.

Aufgabe war es (Seite 4, letzter Absatz der Beschreibung vorliegender Anmeldung) ein Verfahren und eine Wursthülle zur Verfügung zu stelle, die sich durch gleichmäßige Einfärbung auszeichnen. Dies wird mit dem beanspruchten Verfahren unter Zumischung der Viskoselösung zu einer alkalischen Farbflotte erreicht.

Im Stand der Technik findet sich kein Hinweis auf einen solchen Verfahrensschritt um ein gleichmäßiges Färben von Wursthüllen zu erreichen.



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PATENT COOPERATION TREATY**PCT****INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference WW 5504-PC Pt	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP99/02553	International filing date (day/month/year) 16 April 1999 (16.04.99)	Priority date (day/month/year) 28 April 1998 (28.04.98)
International Patent Classification (IPC) or national classification and IPC A22C 13/00		
Applicant WOLFF WALSRÖDE AG		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of _____ sheets.</p>	
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>	

Date of submission of the demand 18 October 1999 (18.10.99)	Date of completion of this report 16 February 2000 (16.02.2000)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP99/02553

I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

- ☒ the international application as originally filed.
- ☒ the description, pages 1-13, as originally filed,
 pages _____, filed with the demand,
 pages _____, filed with the letter of _____,
 pages _____, filed with the letter of _____.
- ☒ the claims, Nos. 1-9, as originally filed,
 Nos. _____, as amended under Article 19,
 Nos. _____, filed with the demand,
 Nos. _____, filed with the letter of _____,
 Nos. _____, filed with the letter of _____.
- ☐ the drawings, sheets/fig _____, as originally filed,
 sheets/fig _____, filed with the demand,
 sheets/fig _____, filed with the letter of _____,
 sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP 99/02553**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims	1-9	YES
	Claims		NO
Inventive step (IS)	Claims	1-9	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-9	YES
	Claims		NO

2. Citations and explanations

The subject matter of Claims 1-9 meets the requirements of PCT Article 33(2) and (3). The closest prior art, document US-A-3 293 340, which is already discussed in the description, describes the mixing of a pigment paste with viscose.

The object of the invention (page 4, last paragraph of the description of the present application) was to provide a process and a sausage casing characterised by uniform coloration. This object is achieved with the claimed process by the admixture of the viscose solution to an alkaline dyeing liquor. The prior art does not give any indication of such a process step in order to achieve uniform coloration of sausage casings.

